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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/735,908	12/16/2003	Seung-Do Han	P24708	3880

7055 7590 03/10/2005

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RESTON, VA 20191

EXAMINER

NGUYEN, TRAN N

ART UNIT	PAPER NUMBER
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2834

DATE MAILED: 03/10/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/735,908	HAN ET AL	
	Examiner	Art Unit	
	Tran N. Nguyen	2834	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☐ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☐ Claim(s) 1-21 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____ | 6) <input type="checkbox"/> Other: ____ |

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. **Claim 1** is rejected under 35 U.S.C. 102(b) as being fully anticipated by **Ivanics (US 4,745,318)**.

Ivanics discloses a single induction motor (figs 1, 3-4) comprising:

a stator (2) installed at an inner circumferential surface of a motor body (1), wherein the stator on which a plurality of coils (3) are wound;

a rotor (4) rotatably installed at a center portion of the stator and provided with a rotation shaft (10) at a center thereof, and

a magnet unit (6) freely and rotatably installed between the stator and the rotor with an air gap (figs 1, 3-4).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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3. **Claims 2-4 and 8-9** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Ivanics** in view of **Elliott et al (US 4,694,210)**.

Ivanics discloses the single-phase induction motor with the following:

the magnet unit is a cylindrical ring magnet (6) located between the stator (2) and the rotor (4),

a supporter (7) of non-magnetic substance is coupled to both ends of the ring magnet, for supporting the ring magnet, and

a bearing (8, 12), particularly needle bearing, which is an oil-less bearing, is fitted into a center of the supporter (7) so as to be rotatably coupled to an outer circumferential surface of the rotation shaft.

Ivanics' Figs 1 and 3-4 show the bearing (8, 12) fitted into the center of the support without any additional fastening component to secure the bearing therebetween. *Therefore, Ivanics does not clear disclose that the bearing is press-fit fitted into a center of the supporter so as to be rotatably coupled to an outer circumferential surface of the rotation shaft.*

Elliott, however, teaches a support structure having bearing (104, 106) press-fit into the supporter and snugly secured within the supporter to abut outer circumferential surface of the rotation shaft. Bearings press-fit between two components for supporting rotation are well known in the art. Those skilled in the art would realize that by press-fitting the bearing therebetween the supporter and the shaft, one can provide a mechanical orientation of the rotor and the shaft, as well as the bearing for an easy to assemble motor design with a minimal number of part counts and eliminate additional fastening means to abut the bearing therebetween the two structure.

Thus, it would have been obvious to one skilled in the art at the time the invention was made to modify the motor by provide the bearing as press-fit bearing, as taught by **Elliott**. Doing so would provide a mechanical abutment among the supporter, the shaft and the bearing for an easy to assemble motor design with a minimal number of part counts and eliminate additional fastening means to abut the bearing therebetween the two structure.

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Regarding claim 8 recites the bearing is ball bearing, Ivanics discloses the bearing is needle bearing. However, those skilled in the art would understand that ball bearings are well known for the purpose of rotatably supporting a rotor or a stator in a motor, and an artisan would have the necessary mechanical skills to determine an appropriate bearing type to be used because this is a matter of engineering design choice based upon the size, shape and weight of the rotor.

Therefore, it would have been obvious to one skilled in the art at the time the invention was made to modify the motor by selecting a ball bearing for rotatably supporting the magnet unit. Doing so would ensure the mechanical support for the rotation of rotor's magnet unit based upon the size and weight of thereof. Furthermore, ball bearings are well known in the art for the purpose of rotatably supporting a rotor, and an artisan would have the necessary mechanical skills to determine an appropriate bearing type to be used.

4. **Claims 5-7 and 10-15** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Ivanics and Elliott**, as applied in the rejection against the base claim, and in view of **Shiga et al et al (US 6, 093,984)**.

The combination of **Ivanics and Elliott** refs substantially discloses the claimed invention, except for the added limitations of the above listed claims.

Regarding claims 5 and 10-11, and 13, **Shiga**, however, teaches a rotor magnet unit (figs 1-2) comprising:

a soft magnetic back yoke (36) in the rotor;

a plurality of permanent magnets (38) attached to an circumferential surface of the back yoke (36);

a supporter (29) is integrally injection-molded at one side of the ring magnet in order to couple to one end of the back yoke (7) so as to support the back yoke.

Shiga teaches that the rotor magnet unit structure would be more reliable, and a simple and economical connection between the permanent magnet ring and the plastic support element without the magnet cracking; and that a long service life and good startup properties are

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guaranteed. In addition, a further object of the invention is also to guarantee that the mounting of the rotor is easy to produce and that it enables easy installation of the rotor into the housing of the electric motor and guarantees quieter operation.

Thus, it would have been obvious to one skilled in the art at the time the invention was made to modify the motor by configuring the rotor with molded supporter, a magnetic back yoke, and plural magnets formed into a cylindrical ring, wherein the supporter is integrally molded to one end of the magnet ring, as taught by Shiga. Doing so would provide the motor with a rotor that would be more reliable and quieter operation.

Regarding the supporter is integrally injection-molded at both sides of the ring magnet, as in claims 6, and 14, Ivanics discloses that the magnet ring is supported at both sides thereof by supporter (7). Shiga teaches that the supporter can be integrally injection-molded to the magnet ring for ensuring firmly mechanical support and structurally reliable.

Thus, it would have been obvious to one skilled in the art at the time the invention was made to modify the motor by configuring both end-side supporters as integrally injection-molded structure with the magnet, as taught by Shiga. Doing so would ensuring firmly mechanical support and structurally reliable of the magnet unit.

Regarding the supporter is formed of the same material as the ring magnet, as recited in claim 7, or the yoke is a non-magnetic substance, as in claim 12, those skilled in the art would understand that fabricating the supporter as a magnet material, which the same as of the permanent-magnet ring, would enhance the magnetic characteristics thereof because the supporter would serve as a back yoke that bundling the magnetic flux of the rotor; however, this would increase the manufacturing cost, and overall weight of the rotor unit.

By the same token, the soft magnetic yoke serving as magnetic back components for returning the magnetic flux in the rotor, fabricating the magnet yoke as nonmagnetic material would reduce the manufacturing cost by saving magnetic material; however, an artisan would

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want to ensure that the magnet ring is fabricated with a suitable high qualified magnet material in order to prevent magnetic characteristic degenerations of the magnet unit.

Thus, it would have been obvious to one skilled in the art at the time the invention was made to modify the motor by selecting a suitable material for the supporter and for the yoke, as claimed. Doing so would either enhance the magnetic characteristics of the magnet unit or reducing manufacturing cost. Furthermore, it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious engineering design choice (*In re Leshin*, 125 USPQ 416. Emphasis added).

Regarding the back yoke is set as 0.2-0.6 mm, as in claim 15, Shiga teaches a back yoke but silence about the thickness thereof. Those skilled in the art would understand that in order to ensure that the back yoke sufficiently provide both mechanically and magnetically supports the magnet ring, the width-size of the back yoke is selected based upon the size of the magnet ring. Doing so would be a matter of obvious engineering design that requires only necessary skills. Evidently, as the claimed language points out, it is preferably set to be in the recited range.

Thus, it would have been obvious to one skilled in the art at the time the invention was made to modify the motor by configuring the back yoke having the thickness as in the recited range of 0.2-0.6 mm. Doing so would ensure that the back yoke would sufficiently both mechanically and magnetically support the magnet ring. Furthermore, it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art (*In re Aller*, 105 USPQ 233).

5. **Claims 16-21** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Ivanics and Elliott**, as applied in the rejection against the base claim, and in view of **Bernreuther et al** (US PgPub 2003/0,168,925).

The combination of **Ivanics** and **Elliott** refs substantially discloses the claimed invention, except for the added limitations of the above listed claims.

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Regarding claims 16-17, 19, and 20-21, for the purpose of providing a rotor that is noise reduced, reliable increased, and construction simplified without the magnet cracking, **Bernreuther**, teaches a rotor structure (fig 1a, 1c-d, and 2) with magnet unit (5) having molded supporter (8) incorporated support the magnet of the rotor by molding (22); wherein molded supporter (8) is integrally injection-molded at both side of the ring magnet. Also, as shown in figs 1b and 2, the rotor has a single cylindrical magnet having a curvature arranged in the molding towards a circumference direction.

Thus, it would have been obvious to one skilled in the art at the time the invention was made to modify the motor by configuring the magnet unit with integrally injection-molded supporter at both side of the ring magnet incorporated support the magnet of the rotor by molding, as taught by **Bernreuther**. Doing so would provide the rotor with a magnet unit that would be more reliable, quieter, and simpler.

Regarding claim 18, while Ivanics discloses the supporters are at both sides of the magnet ring, those skilled in the art would realize that this is a matter of determine the level of support that the magnet ring requires. For example, Shiga, as discussed in previous section, shows the supporter as an injection-molded structure at one side of the molding still sufficiently provide support for the magnet ring. This is a matter of obvious engineering design choice to provide one side support or both sides support for the magnet ring based upon the size and weight of the magnet ring. As for one side support, this would reduce the overall size of the magnet unit and simplify the manufacturing process.

Thus, it would have been obvious to one skilled in the art at the time the invention was made to modify the motor by configuring the supporter as an injection-molded structure at one side of the molding. Doing so would reduce the overall size of the magnet unit and simplify the manufacturing process while equivalently provide the mechanical support for the magnet ring.

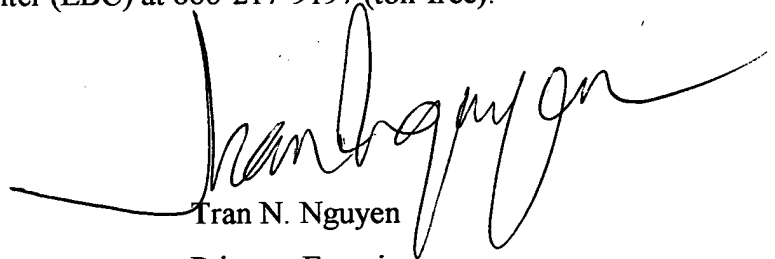
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Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tran N. Nguyen whose telephone number is (571) 272-2030. The examiner can normally be reached on M-F 7:00AM-4:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Darren Schuberg can be reached on (571)-272-2044. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read 'Tran N. Nguyen', is written over a horizontal line.

Tran N. Nguyen

Primary Examiner

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